

WHAT IS CLAIMED IS:

Sub A8
1 A transconductance cell for use in a system on chip to reduce adverse
2 effects of bulk semiconductor voltages on transconductance comprising a plurality of current
3 sources interconnected to provide an output transconductance control voltage, and a variable
4 load for the current sources including first and second load resistors each serially connected
5 with one of the plurality of current sources, and a variable resistance interconnecting nodes of
6 the load resistors, the variable resistance comprising a pair of native MOS transistors having
7 low threshold voltages.

1 2. The transconductance cell as defined by claim 1 wherein the first and
2 second load resistors comprise first and second MOS transistors.

1 3. The transconductance cell as defined by claim 2 wherein the pair of
2 native transistors are serially connected between source elements of the first and second MOS
3 transistors.

1 4. The transconductance cell as defined by claim 3 wherein gate elements
2 of the native MOS transistors are connected to receive a control voltage.

1 5. The transconductance cell as defined by claim 4 wherein the system on
2 chip comprises a radio receiver, and the transconductance cell is used in a low pass filter of
3 the radio receiver.

1 6. The transconductance cell as defined by claim 5 wherein the
2 transconductance cell is used also in a voltage controlled oscillator.

Sub A9
1 7. The transconductance cell as defined by claim 4 wherein the system on
2 a chip comprises a radio receiver, and transconductance cell is used in a voltage controlled
3 oscillator.

1 8. The transconductance cell as defined by claim 1 wherein the system on
2 a chip comprises a radio receiver, the transconductance cell is used in a low pass filter of the
3 radio receiver.

1 9. The transconductance cell as defined by claim 8 wherein the
2 transconductance cell is used also in a voltage controlled oscillator.

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1 10. The transconductance cell as defined by claim 1 wherein the system on
2 chip comprises a radio receiver, and a transconductance cell is used in a voltage controlled
3 oscillator.

1 11. A method of reducing noise susceptibility due to bulk semiconductor
2 voltages in a system on chip employing gyrators in filter elements comprising the steps of:

3 a) providing a gyrator cell with resistive loads for a plurality of current
4 sources, the resistive loads including first and second MOS transistors, and

5 b) connecting a variable resistance between the first and second MOS
6 transistors, the variable resistance comprising two serially connected native MOS transistors
7 having low threshold voltages.

1 12. The method as defined by claim 11 wherein gate elements of the native
2 MOS transistors are connected to receive a control voltage.

1 13. The method as defined by claim 12 wherein the system on the chip
2 comprises a radio receiver, and wherein gyrators are used in low pass filters of the radio
3 receiver.

1 14. A gyrator comprising a plurality of current sources interconnected to
2 provide output transconductance control voltages, and a variable load for the current sources
3 including first and second load resistors, each serially connected with one of the plurality of
4 current sources, and a variable resistance interconnecting nodes of the load resistors, the
5 variable transistor resistance comprising a pair of native MOS transistors having low
6 threshold voltages.

1 15. The gyrator as defined by claim 14 wherein the first and second load
2 resistors comprise first and second MOS transistors.

1 16. The gyrator as defined by claim 14 wherein the pair of native
2 transistors are serially connected between source elements of the first and second MOS
3 transistors.

1 17. The gyrator as defined by claim 16 wherein gate elements of the native
2 MOS transistors are connected to receive a control voltage.

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21